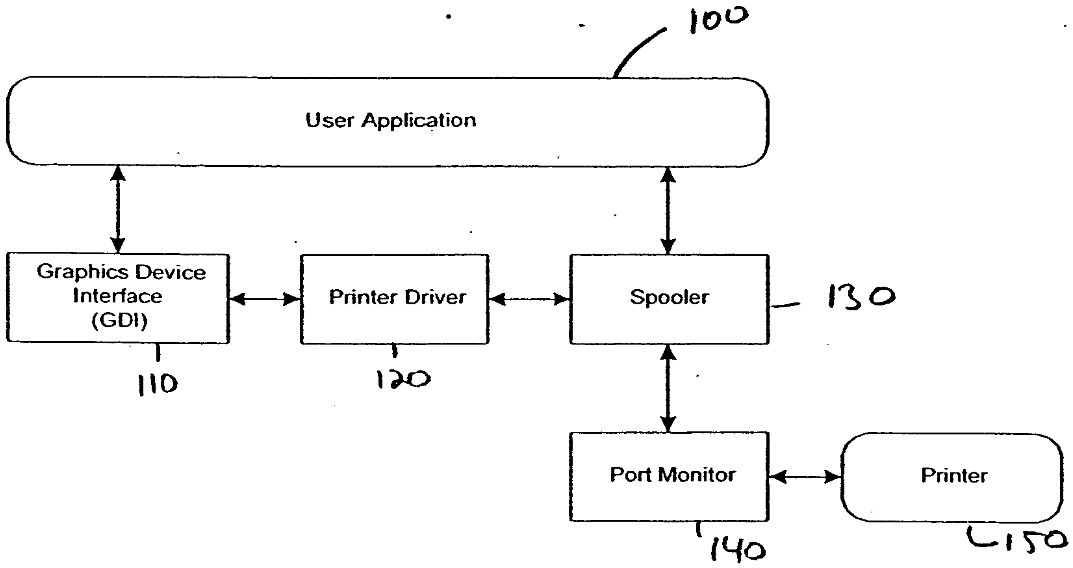


Figure 1

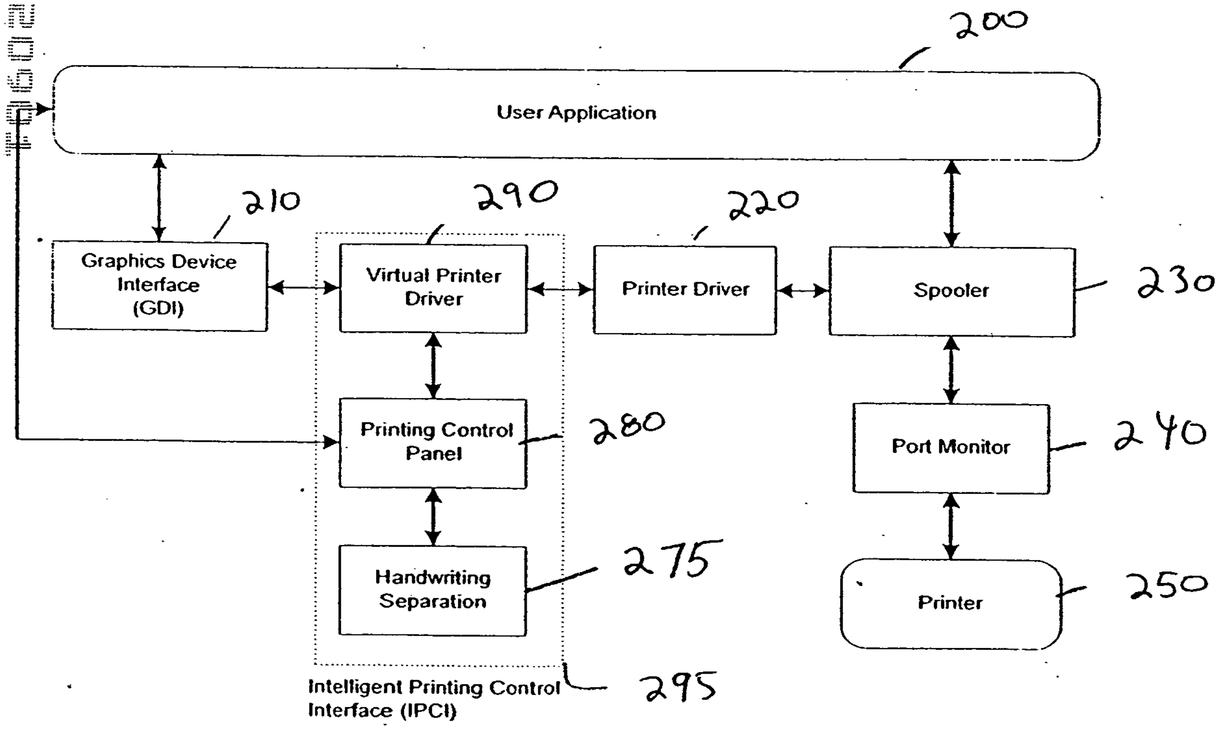


Figure 2

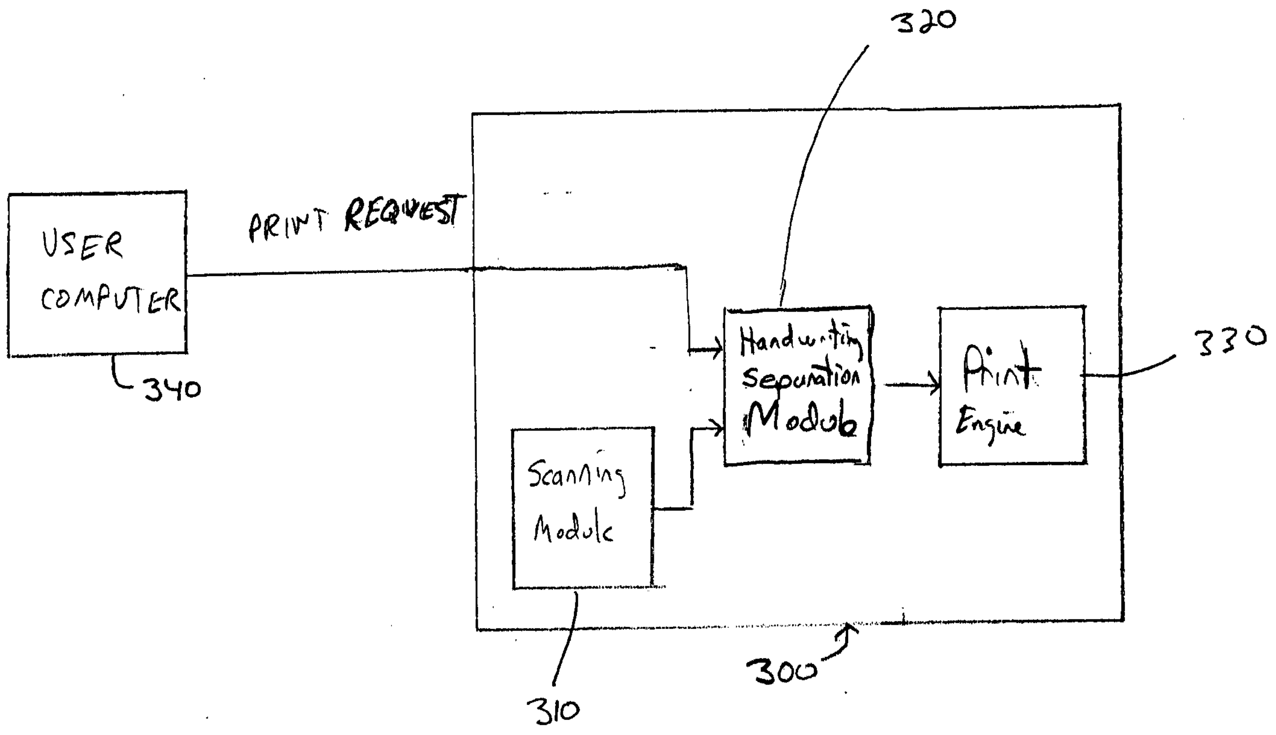
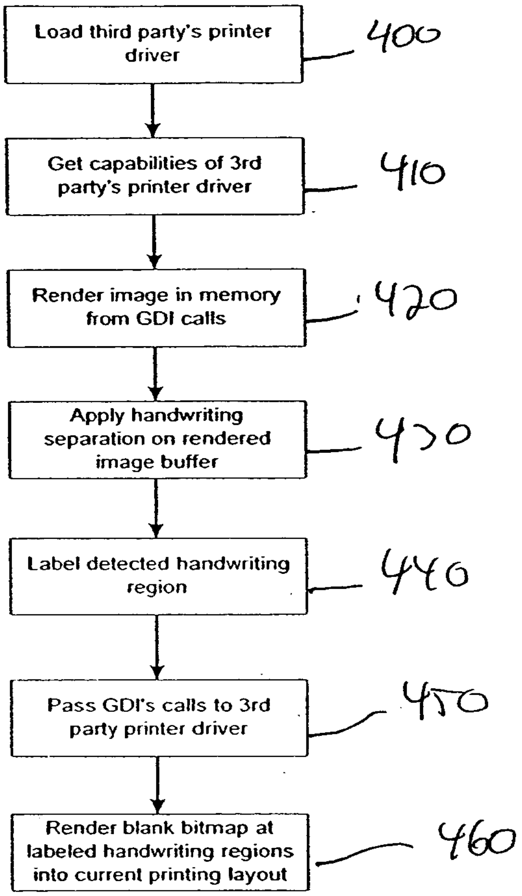

USER COMPUTER
340
PRINT REQUEST
320
Handwriting Separation Module
Print Engine
330
Scanning Module
310
300

Figure 3



Load third party's printer driver
400
Get capabilities of 3rd party's printer driver
410
Render image in memory from GDI calls
420
Apply handwriting separation on rendered image buffer
430
Label detected handwriting region
440
Pass GDI's calls to 3rd party printer driver
450
Render blank bitmap at labeled handwriting regions into current printing layout
460

Figure 4

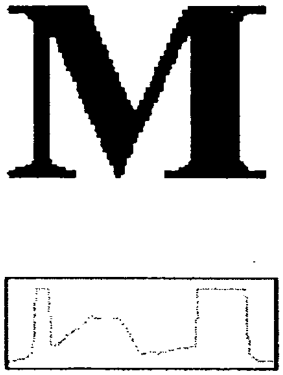


Fig 5A

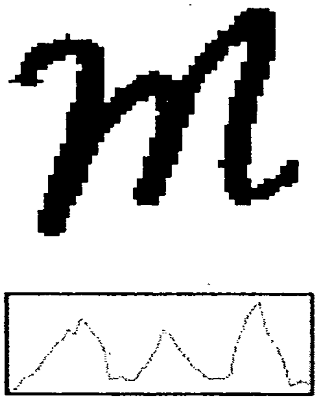


Fig. 5B

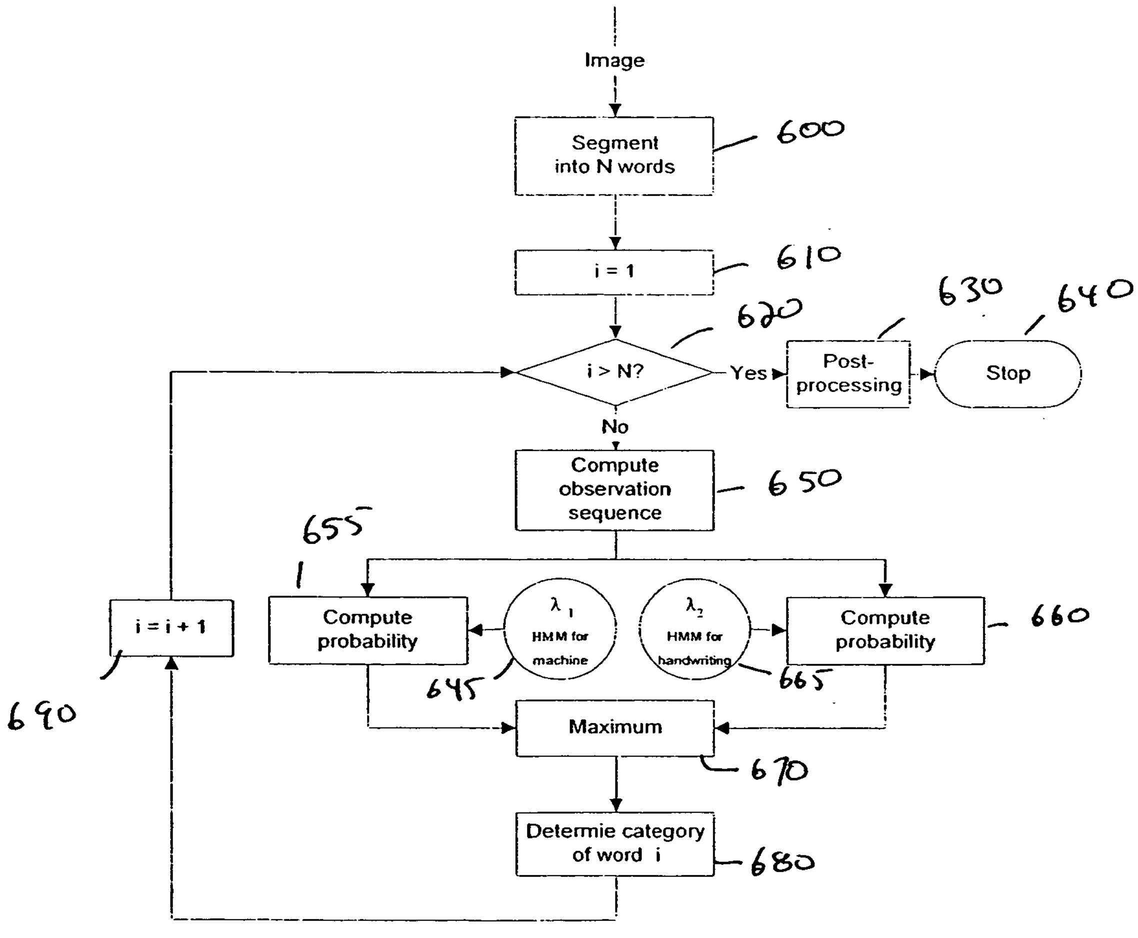
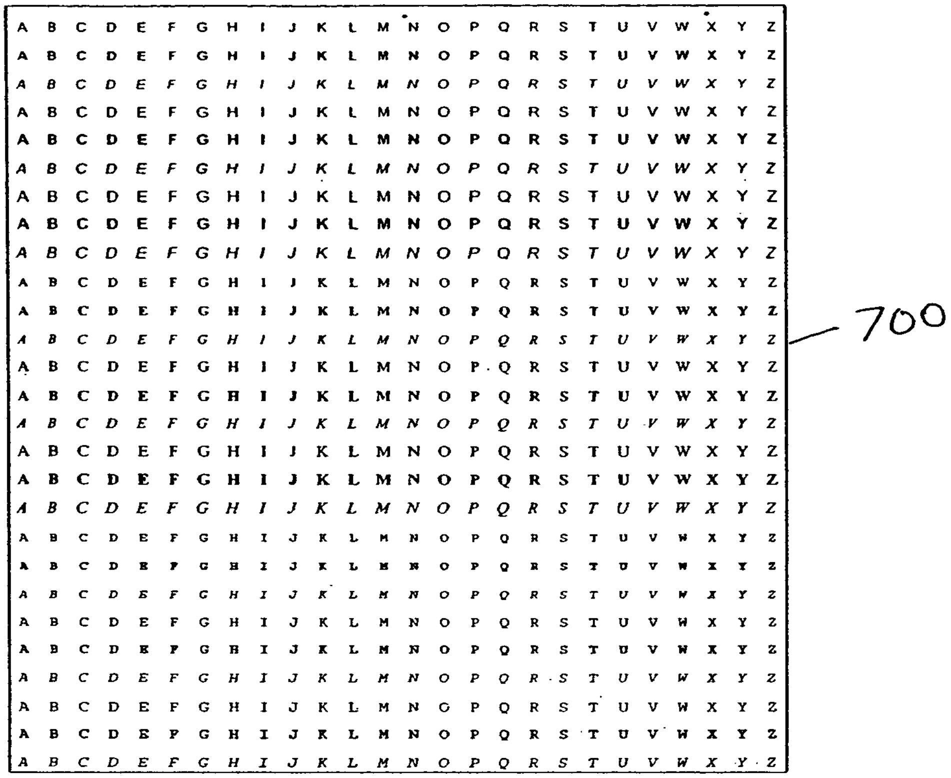


Image
Segment into N words
600
i = 1
610
i > N?
620
Yes
Post-processing
630
Stop
640
No
Compute observation sequence
650
655
Compute probability
λ1 HMM for machine
645
λ2 HMM for handwriting
665
Compute probability
660
i = i + 1
690
Maximum
670
Determie category of word i
680

Fig. 6



A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
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A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Fig. 7

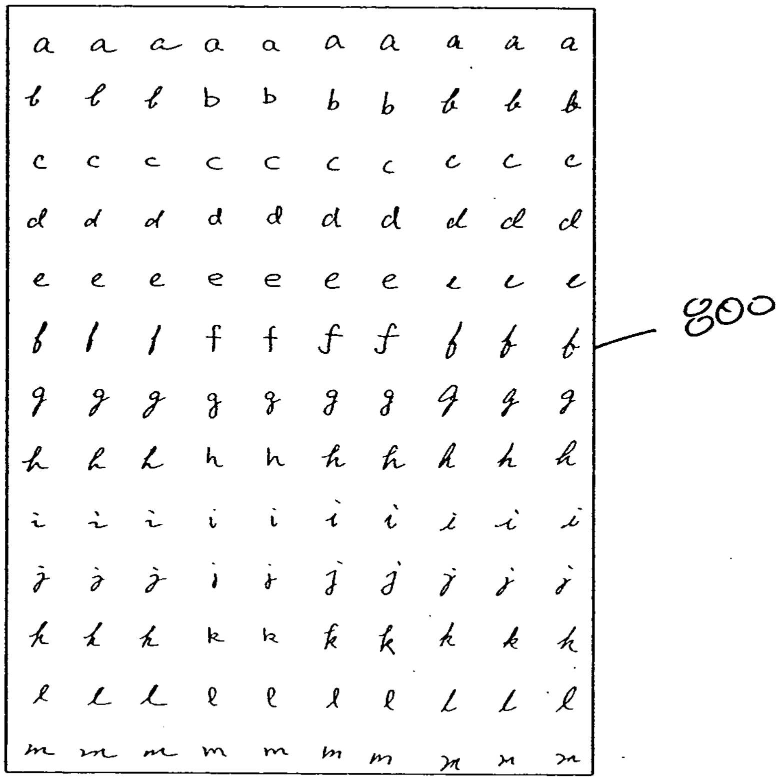
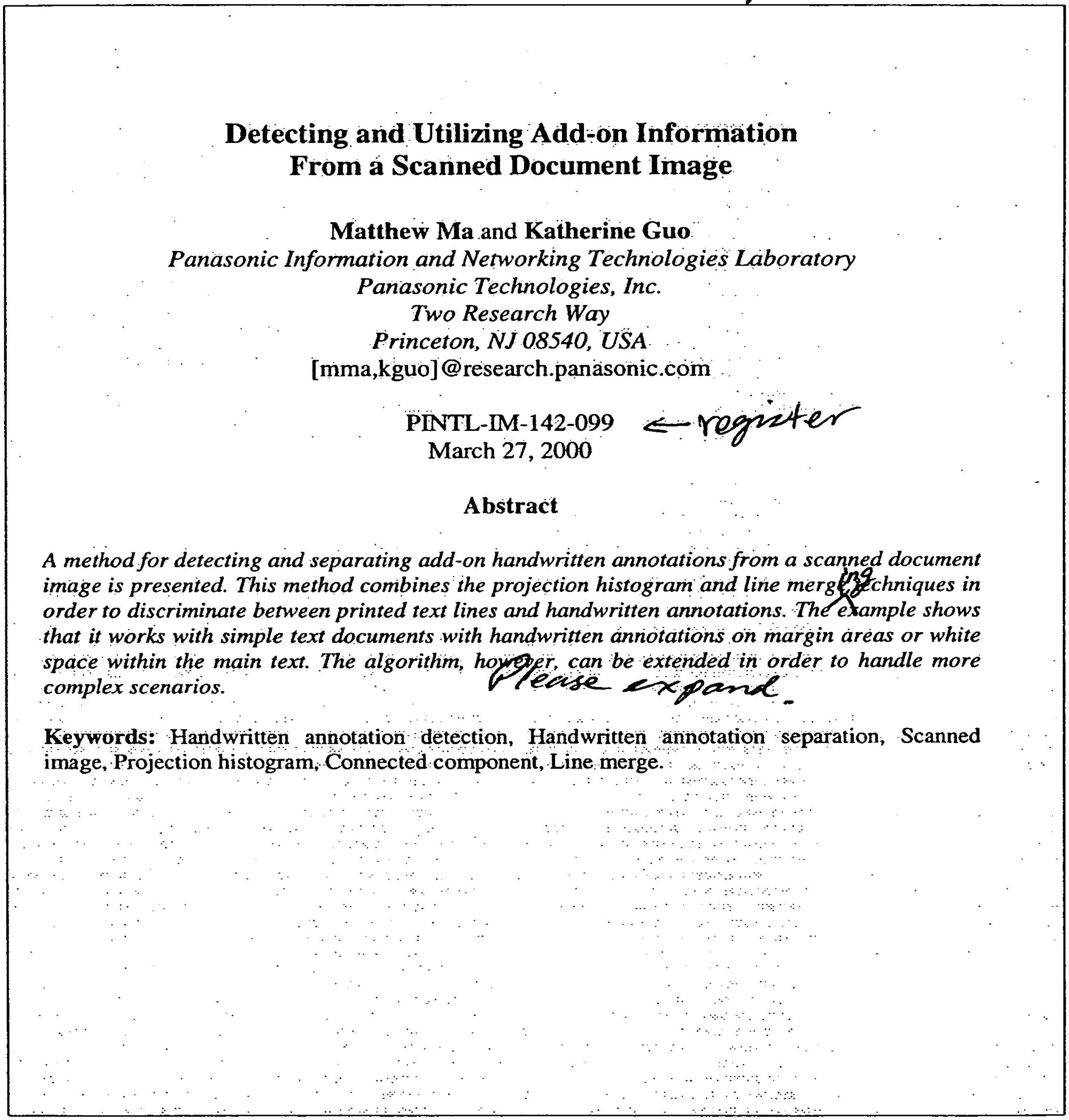


Fig. 8

900



Detecting and Utilizing Add-on Information From a Scanned Document Image

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PINTL-IM-142-099 ← register
March 27, 2000

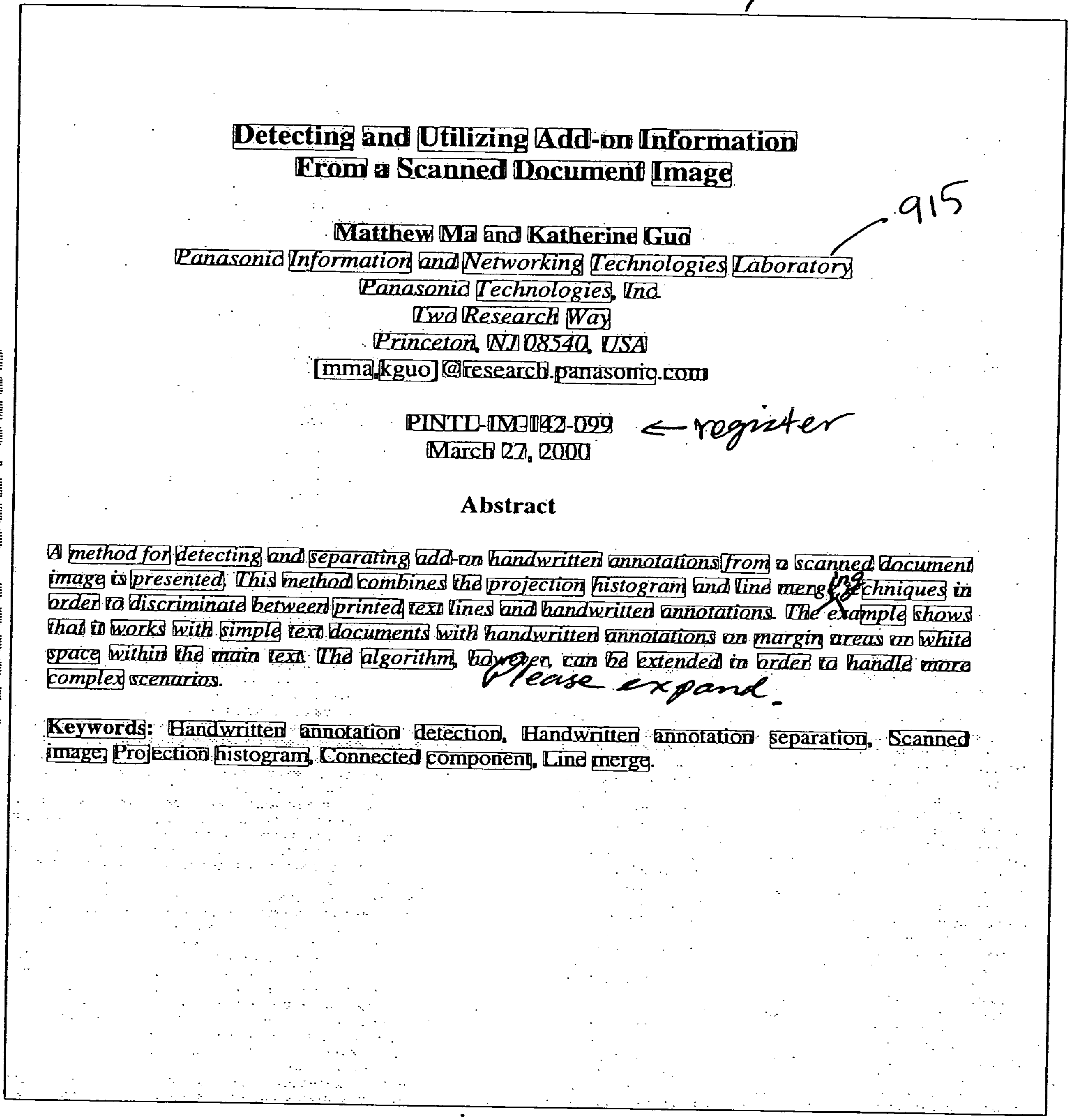
Abstract

A method for detecting and separating add-on handwritten annotations from a scanned document image is presented. This method combines the projection histogram and line merg~~e~~ing techniques in order to discriminate between printed text lines and handwritten annotations. The example shows that it works with simple text documents with handwritten annotations on margin areas or white space within the main text. The algorithm, however, can be extended in order to handle more complex scenarios. Please expand.

Keywords: Handwritten annotation detection, Handwritten annotation separation, Scanned image, Projection histogram, Connected component, Line merge.

Figure 9

910



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915

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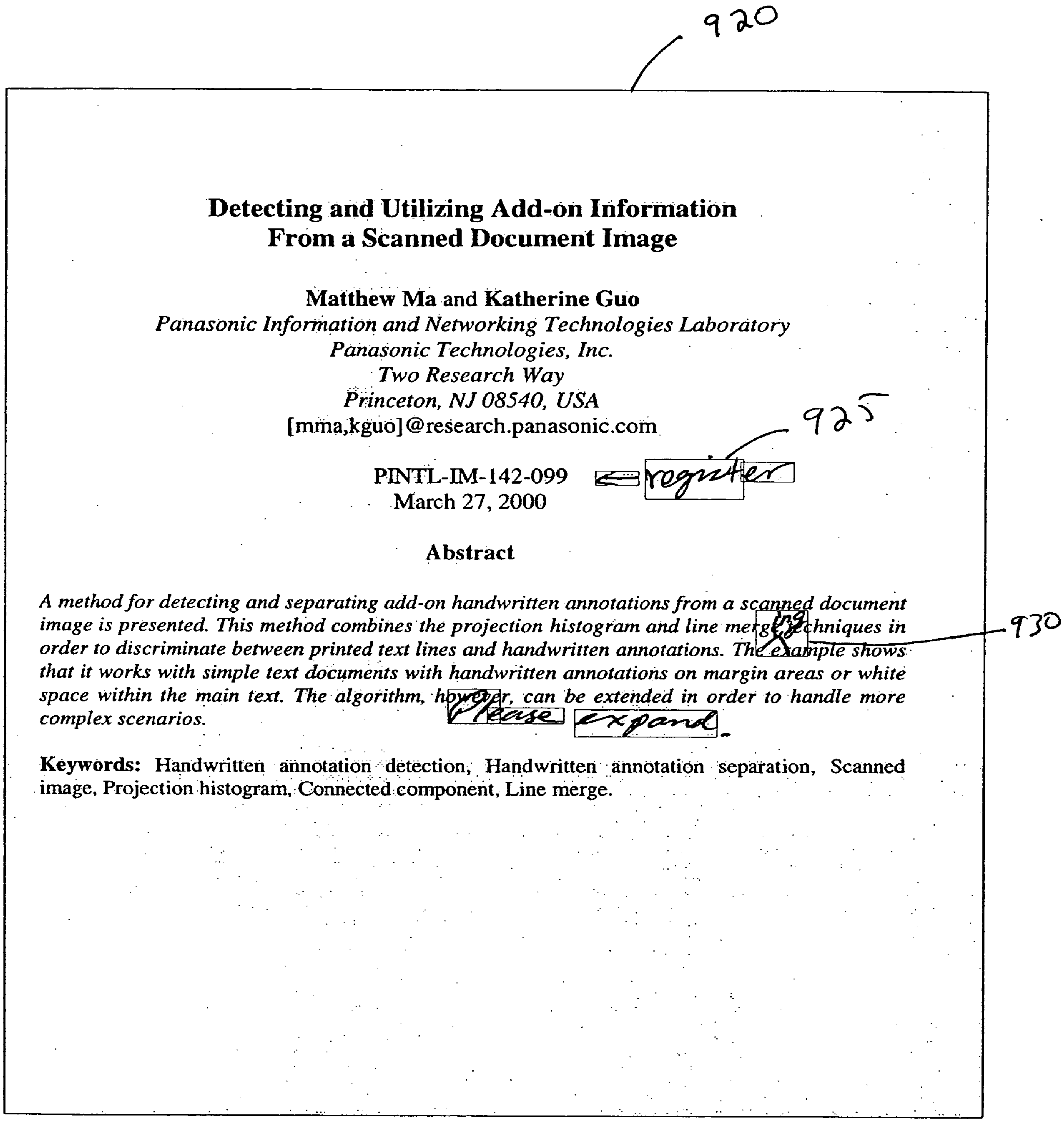
Keywords: Handwritten annotation detection, Handwritten annotation separation, Scanned image, Projection histogram, Connected component, Line merge.

Figure 10



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From a Scanned Document Image

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Figure 11